

What is claimed is:

CLAIMS

1. A system for performing operations on a plurality of workpieces, the system comprising:
 - an operations portion and a load/unload portion;
 - 5 a plurality of independently operable work heads located in the operations portion, the work heads each being operable to perform work on the plurality of workpieces;
 - 10 a transfer system, the transfer system including a plurality of mounting devices, the transfer system being operable to deliver the mounting devices into and out of the operations portion of the system,
 - the plurality of workpieces being contained in workpiece-holding structures, the workpiece-holding structures being mountable on the plurality of mounting devices;
 - 15 the load/unload portion being operable to load the workpiece-holding structures onto one of the plurality of mounting devices prior to delivery of the mounting devices into the operations portion by the transfer system to perform work on the plurality of workpieces by the independently operable work heads;
 - the load/unload portion being further operable to unload the workpiece-holding structures from one of the plurality of mounting devices,
 - 20 wherein one of the plurality of mounting devices is positioned in the operations portion of the system and work is performed on the plurality of workpieces by at least one of the plurality of independently operable work heads while another one of the plurality of mounting devices is positioned in the load/unload portion of the system and workpiece-holding structures are unloaded from the mounting devices.

2. The system of claim 1, wherein the workpieces are electronic substrates and the work heads are dispensing heads.

5 3. The system of claim 1, wherein the workpiece-holding structures are trays and the trays hold electronic substrates.

4. The system of claim 3, wherein the trays are AUER boats.

10 5. The system of claim 1, wherein the mounting devices are pallets for holding the workpiece-holding structures.

6. The system of claim 2, wherein the work performed on the workpieces is the dispensing of underfill onto the electronic substrates.

15 7. The system of claim 1, wherein each of the independently operable work heads further comprises a vision alignment apparatus to align the independently operable work heads to the plurality of workpieces.

20 8. A method for performing operations on a plurality of workpieces using an apparatus having an operations portion and a load/unload portion; a plurality of independently operable work heads located in the operations portion, the work heads each being operable to perform work on the plurality of workpieces; a transfer system, the transfer system including first and second mounting devices, the transfer system

being operable to deliver the first and second mounting devices into and out of the operations portion of the system and out of and into the load/unload portion, respectively; the plurality of workpieces being contained in workpiece-holding structures, the workpiece-holding structures being mountable on the first and second mounting devices;

5 the load/unload portion being operable to load the workpiece-holding structures onto one of the mounting devices and to unload the workpiece-holding structures from one of the mounting devices, the method comprising:

(a) mounting the workpiece-holding structures onto a first mounting device prior to delivery of the mounting devices into the operations portion to perform work on the

10 plurality of workpieces by the independently operable work heads;

(b) moving the first mounting device into the operations portion using the transfer system to have work performed on the plurality of workpieces by at least one of the plurality of independently operable work heads;

(c) moving the second mounting device using the transfer system to the unload 15 portion;

(d) when the first and the second mounting devices have been positioned, respectively, at the operations portion and the load/unload portion, performing work on the workpieces on the first mounting devices while unloading workpiece-holding structures from the second mounting device.

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9. The method of claim 8, further comprising repeating steps (a), (b) and (c) such that workpiece-holding structures are unloaded from a mounting device after having had work performed on the plurality of workpieces contained in the workpiece-holding

structures at approximately the same time period the workpieces which have not had work performed on them are delivered to the operations portion.

10. An apparatus for performing operations on a plurality of workpieces
 - 5 comprising:
 - an operations portion and a load/unload portion;
 - a plurality of independently operable work heads located in the operations portion, the work heads each being operable to perform work on the plurality of workpieces; and
 - 10 a transfer system, the transfer system including a plurality of mounting devices, the transfer system being operable to deliver the mounting devices into and out of the operations portion of the system,
 - 15 wherein the plurality of workpieces being contained in workpiece-holding structures, the workpiece-holding structures being mountable on the plurality of mounting devices, and
 - 20 wherein one of the plurality of mounting devices is positioned in the operations portion of the system and work is performed on the plurality of workpieces by at least one of the plurality of independently operable work heads while another one of the plurality of mounting devices is positioned in the load/unload portion of the system and workpiece-holding structures are unloaded from the mounting devices.